

MOTIVATING STUDENTS WITH EXPERIENTIAL LEARNING VIA REAL-WORLD PROJECTS

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1 ABSTRACT

In design education, some professors strive to find real-world projects from the community for students to practice their design skills instead of giving students speculative projects. This paper describes how a landscape architecture faculty used actual projects with real clients for academic teaching and community service through service-learning. Such practical, hands-on experience is crucial in landscape architectural design programs, as real-world projects provide students with more effective learning outcomes. Although service learning and community engagement are part of the CELA's mission, the focuses mainly have been on the issues of urban green spaces, community heritage landscapes, sustainable community design, neighborhood transformation, cross-cultural community engagement, urban design collaborative and rural development. As a result, students' learning and motivation stemming from philanthropic values have often been overlooked. This study applied real-world learning approaches with the additional focus on students' experiential learning experience, client-professional interaction, and community service awareness. The faculty selected three service projects for three design classes to engage in this study and conducted a follow-up survey. The data and collected comments were analyzed, and the results were presented in bar charts, data tables, and preference distribution curves. This paper examines how the students were motivated when they faced a real-world project with a real client versus a speculative project. It also revealed the benefits of being able to interact with real clients during the design process of a real-world project. The survey results confirmed that real-world projects provided benefits to students' learning and facilitated better teaching outcomes in design education.

1.1 Keywords

Real-World Project, Design Education, Real Client, Service-Learning, Community Service.

2 INTRODUCTION

Traditionally, design skills and knowledge were transferred through a master to apprentice relationship. Nowadays, design education has moved to the studio tables in the university classroom where experienced designers guide students through “speculative design problems” (Mewburn, 2010, p. 363). This paper described how a landscape architecture faculty with an Extension appointment functioned as a bridge between formal education and community service through service-learning with real-world projects. Faculty invited students to tackle their community’s design challenges, concurrently developing their on-site learning and sense of civic responsibility. This paper examines landscape architecture students’ interest and motivation when presented with a real-world project versus a speculative project and the author would like to share the process with other design educators.

Although service-learning and community engagement are part of the Council of Educators in Landscape Architecture’s (CELA’s) mission, CELA focuses mainly on the issues of urban green spaces, public space disparities, community heritage landscapes, sustainable community design, neighborhood transformation, cross cultural community engagement, the heritage of agrarianism, the structure of engaging communities, performative space, discourse on community development, urban design collaboration and rural development (ISOMUL and CELA, 2010, pp. 77-90; CELA, 2016, pp. 250-263). As a result, students’ learning and community engagement have often not been emphasized. This study proposed four approaches to service projects for student learning: (1) real project-centered learning, (2) experiential learning experience, (3) client-professional interaction, and (4) community service awareness. To test the approaches, the lead faculty assigned 27 Oklahoma State University (OSU) landscape architecture students a selection of three different types of service-learning projects from three different communities. Students had the opportunity to study the physical project site, meet the clients, develop programs, propose design solutions and present their master plans for review and evaluation. As Sipe (2001, p. 38) states, academic service-learning projects provide students “with authentic experiences that allow them to better understand and value perspectives of others, to build their own powers as reflective and critical thinkers, and to create habits of service with a vital role in shaping the world”. During this study, OSU faculty, students and community members interacted at various stages of the design process, providing project-based skills for students to enhance their landscape architecture design learning, critical thinking and civic responsibility.

3 CONCEPTUAL FRAMEWORK

The main objective of this study was an analysis of the effectiveness of service-learning approaches among students participating in real-world projects. The author initiated this study as a response to OSU landscape architecture students’ request for a studio project that would be an alternative to the speculative campus project that OSU faculty had repeated for many years. Although speculative projects simulate real-world restrictions, budgets, site constraints, etc., they do not have real clients. This paper highlights the presence of clients, the community, and the service-learning interaction as the significant difference between service-learning projects and speculative projects. Faculty identified a suitable alternative project for the students: a soon-to-be-built OSU Extension service project. During the site design process, students showed great enthusiasm and delivered a very successful design package at the end of the semester. Encouraged by the first service-learning project results, in later semesters more service-learning projects were introduced to classrooms to continue to give students a worthwhile and unique learning experience. After three projects, positive feedback from students has motivated the author to write this paper to share the process with other design educators.

This study proposed four approaches to service-learning projects. These four approaches focused on four important themes: (1) real project-centered learning, (2) experiential learning experience, (3) client-professional interaction, and (4) community service awareness. The real project-centered learning approach aimed to create a real-world learning environment in a landscape architecture studio for students to get involved with their community. Through participation in speculative projects, students gain experience in writing reports and preparing schematic design solutions that they can later apply to real world design problems (Loon, 2010, pp. 23-32; Govekar & Rishi, 2007, p. 3). The experiential learning experience approach allowed students to grow and mature through their exposure to community needs, community member’s expectations, technical assistance and reciprocal benefits (Gallagher and McGorry, 2015, p. 467). The client-professional interaction approach aimed to link communities and schools, creating hybrid “third spaces” where teachers and students could contribute their knowledge by providing professional service to

the community (Gomez et al., 2015, p. 162). The community service awareness approach aimed to develop philanthropic values and behaviors in students that could influence their postgraduate years. Students were able to learn to serve their communities through their involvement in community activities (Seider et al., 2011, p. 485).

Under each approach, the author applied several service-learning methods, including the real project-centered, real site constraints, students in training, collaboration, participation, community assistance, client input/student output, hands-on design skills, public presentation, value awareness, and motivation and teacher as a professional service-learning methods. The author incorporated these methods into various phases of each project as tools for the design process; and the means of communicating among students, teachers and the community. A diagram of the conceptual framework of this paper is presented as follows: (Figure 1)

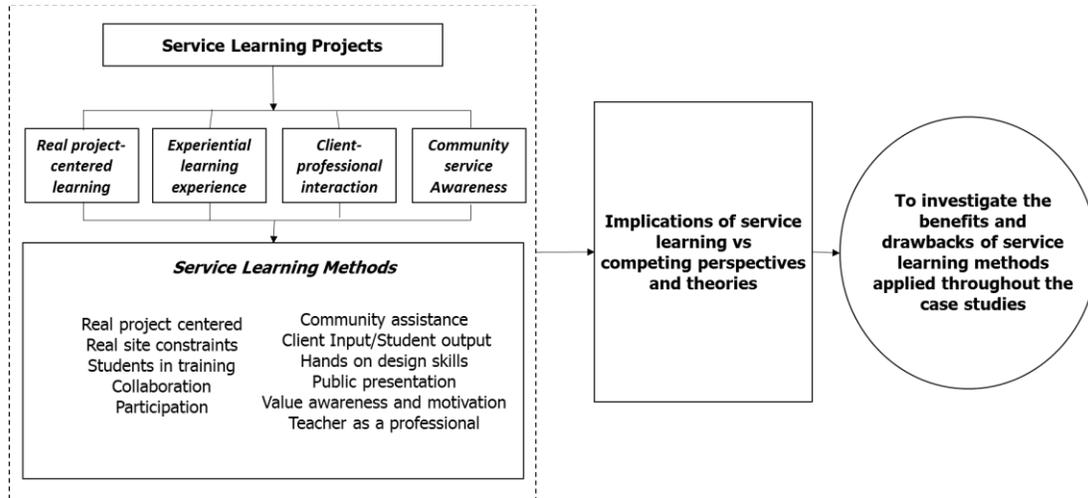


Figure 1: Conceptual framework of this study.

4 LITERATURE REVIEW

Landscape architecture is a discipline of project-based design practice. It is a profession whose design approach can be applied to nearly any scale of landscape space, ranging from a small garden to an entire region. The landscape architecture design solution strives to create better communities, whether it is for one individual, a family, or a neighborhood. Therefore, the integrated relationship of students, faculty and community members is the key to the successful execution of a design project. The outcomes benefit students' overall civic learning, academic learning and personal growth (Felten and Clayton, 2011, p. 78).

4.1 Land-grant tradition and the National Community and Service Trust Act

The National Community and Service Trust Act (NCSTA) of 1993 stated that the purpose of service-learning is to "meet the unmet human, educational, environmental, and public safety needs; renew the ethic of civic responsibility ...; expand educational opportunity ...; encourage national service; support locally established initiatives; and provide structured service opportunities to the participants and community" (NCSTA, 1993, p.74). Section 103 of the Act further defines school and community-based service-learning programs as collaborations between teachers in schools within a community "to create and offer service-learning opportunities for students; ...incorporate service-learning opportunities into a classroom to strengthen academic learning; and coordinate the community service activities" (NCSTA, 1993, p. 32).

OSU, a land-grant university, has been designated by its state legislature or Congress to receive the benefits of the Morrill Acts of 1862 and 1890. The mission of OSU, as set forth in the first Morrill Act, is "to teach agriculture, military tactics, and the mechanic arts as well as classical studies so members of the working classes could obtain a liberal, practical education" (APLU, 2012, p. 1). The Smith-Lever Act of 1914 amended the Cooperative Extension work to consist of "the development of practical applications of research knowledge and giving of instruction and practical demonstration, and other means" (APLU, 2012,

p. 20).

4.2 Service-learning definitions

The OSU Landscape Architecture (LA) program's service-learning projects serve complementary goals: academic learning, civic responsibility, personal growth and community assistance. The development of service-learning projects occurs via various methods, such as phone call requests to the LA program, community-requested assistance through Extension, and an assignment from the university. As service-learning has progressed over time, it has evolved to focus on several core characteristics, such as embedding "learning goals with academic, civic and community purposes, involving reciprocal collaboration among students, faculty/staff, community members, community organizations, and educational institutions, and including critical reflection and assessment processes that document meaningful learning and service outcomes" (Felten and Clayton, 2011, p.76).

Service-learning is often termed "academic service-learning". Howard (1998, p. 22) provides a working definition: "Academic service-learning is a pedagogical model that intentionally integrates academic learning and relevant community service." He further suggests that there are four key components to this definition, "First, academic service-learning is a pedagogical model of teaching methodology. Second, there is an intentional effort made to utilize the community-based learning on behalf of academic learning. Third, there is an integration of experiential learning and academic learning. Fourth, the community service experience must be relevant to the academic course of study" (Howard, 1998, p. 22). For OSU LA service-learning projects, careful project selection provides students with real-world experience interacting with clients and project sites. As faculty coordinate the design process with clients for input and feedback, the students reap the benefits of real-world experience by serving the community. This philosophy resonates with Govekar's (2007, p. 3) assertion that experiential teaching methodologies have been using service-learning "as a means of linking formal classroom instruction with real-world learning that occurs beyond the classroom and involves the community."

4.3 Typology and approaches to service and learning

Britt (2012, p. 80) outlined three approaches to "the typology of service-learning, (a) skill-set practice and reflexivity, (b) civic values and critical citizenship, and (c) social justice activism". This study considered service-learning as a method by which students and faculty collaborate on community projects that develop students' mastery of landscape architecture design and enhance their sense of civic responsibility. Therefore, this study proposed four approaches to service-learning projects, focusing on four important themes: (1) real project-centered learning, (2) experiential learning experience, (3) client-professional interaction, and (4) community service awareness.

The real project-centered learning approach aimed to create a real-world learning environment in a landscape architecture studio. Traditional speculative landscape architecture projects offer students the typical landscape architecture design process with steps of site analysis, schematic design, design development and design presentation; however, they lack the reality of a project site visit, client interview, client input and feedback, and client-community presentation. Real-world learning brings students to the physical project site and engages with real clients and real-world situations. Students learn through such real-world experiences, gaining firsthand landscape architecture knowledge and skills. "Real-world learning by doing not only adds these elements of meaningfulness to the learning endeavor, but also exposes students to the real politic of the organization and to real-world evaluation of their actions" (Bilimoria, 1998, p. 266). Other research points out that through participation in speculative projects, students gain experience in writing reports and preparing schematic design solutions that they can later apply to real world design problems (Loon, 2010, pp. 23-32; Govekar & Rishi, 2007, p. 3). When engaged in academic service-learning with local communities, the teacher needs to apply theory with practice "by reframing service-learning as learning and participation. Learning is happening because of, and in the presence of, social relations and practices" (Kinloch, Nemeth and Patterson, 2015, p. 39).

The experiential learning experience approach allowed students to grow and mature through exposure to the community's needs, clients' expectations, technical assistance and reciprocal benefits. In a capstone course, service-learning is introduced to students using experiential learning techniques to assess student-learning outcomes (Gallagher and McGorry, 2015, p. 467). One study confirms that students' experiences from participating in service-learning with vulnerable populations in inner cities often begins with navigating stereotypes and community needs; however, with time, students transform into more

culturally competent citizens, becoming the advocates for their community's needs and gaining reciprocal benefits. (Knecht and Fischer, 2015, p. 378). Educators need to tap into students' service-learning experiences to gain an in-depth perspective of their experiences and develop projects that match the needs of the community. Bettencourt (2015, p. 473) states that there is a three-way service-learning partnership made up of the student, the faculty member and the community partner. However, student learning is sometimes vaguely defined, often simply assumed to occur, and usually only indirectly assessed. She proposes four methods to evaluate experiential learning outcomes: oral reflective journals, surveys, focus group responses and interviews. "Learning is accomplished by practice during the experience; thoughtful and context-sensitive infusion of theory, evaluation and feedback during and after the experience; and ongoing and subsequent reflection on and conversation about values and actions" (Bilimoria, 1998, p. 266). This study employed similar methods of experiential learning through reflection, review, critique, survey, evaluation and feedback during the students' design process.

The client-professional interaction approach aimed to create hybrid "third spaces" (Gomez, et al., 2015, p. 162) between schools and communities, where teachers and students contributed professional services to communities. In a teaching position with an Extension appointment, service-learning is a natural venue for service to needy communities; in addition, service-learning also provides an opportunity for aspiring teachers to bring their professional knowledge to fruition. This community-teacher interaction, or in landscape architecture terms, "client-professional integration," creates hybrid "third spaces" linking communities and schools (Gomez et al., 2015, p. 162). It is within this hybrid third space that academic learning, civic learning and personal growth converge; fully integrating service-learning into core educational and civic missions. According to Weigert (1998, p. 5), service-learning can be divided into two sides. On the community side, the students provide some meaningful service that meets the needs of a community. On the campus side, the course objectives and project assignments dictate the students' service, which is presented and evaluated by the faculty and the clients. Thus, teachers and students contribute their professional knowledge and service to benefit a community in need.

The community service awareness approach aimed to develop philanthropic values and behaviors in students that could influence their postgraduate years. Students were able to learn to serve their communities by being involved in community activities. Students who participate in service-learning have the proper environment to develop "philanthropic values and behaviors that can influence their postgraduate years through careers, civic activities and family life. Service-learning extends beyond 'serving to learn,' to 'learning to serve' through being involved in community activities" (Hatcher and Studer, 2015, p. 15). In this study, service-learning projects provided opportunities for students to build their academic knowledge and technical skills while developing a keen awareness of contemporary social and environmental issues; in return, students developed philanthropic values and behaviors from the community they served.

4.4 Design process in landscape architecture design education

For design curricula in landscape architecture, bringing real-life projects into teaching fits particularly well. As Loon (2010, p. 24) pointed out, in a landscape architecture program, there are interactive design studio classes where service-learning projects naturally fit better than in traditional lecturing classes. In addition, real-world projects help students engage with the people who own or use the project space. The design process can be grossly classified into four steps: "Generate, Develop, Evaluate, and Communicate" (Gottfredson, 2014, p. 23). In the Generate step, designers compile research, develop a program, select a site, and prepare a site inventory. In the Develop step, designers complete a site analysis, develop a concept, evaluate criteria, and apply a schematic design. In the Evaluate step, designers complete a synthesis, select a concept, prepare a master plan, and execute site planning. In the Communicate step, designers prepare contract documents, execute detailed site designs, and prepare construction documents. At OSU, landscape architecture design education adds a few touches to the design process with four steps: "Real-world, Concept and Form, Schematic, and Master Plan" (Hsu, 2015, p. 48). In the Real-world step, inventory, analysis and thoughts are applied. In the Concept and Form step, idea, theory and program are applied. In the Schematic step, design solutions, criteria and details are applied. In the Master Plan step, site plan, layout plan and construction details are applied. These four steps fit comfortably with the service-learning projects this study employed.

5 METHODS

The lead faculty assigned 27 Oklahoma State University (OSU) landscape architecture students a

selection of three different types of service-learning projects from three different communities. Students gained service-learning real-world project experiences through observation, participation and collaboration in three thematic projects:

1. A Water Conservation Garden on a university campus (designed by 7 students).
2. A Memorial Garden in a retirement community (designed by 9 students).
3. A Public Teaching Garden in a city park (designed by 11 students).

A rigorous design process with four steps: Real-world, Concept and Form, Schematic, and Master Plan was introduced in each service project. These four steps guided the service-learning projects and allowed students the opportunity to interact with physical project sites, meet clients, develop programs, propose design solutions, and present their master plans for review and evaluation.

To gather data, this study used post-workshop surveys, participants' comments and on-site observations. Qualitative attributes gathered from observation and written comments were assessed to gain an understanding of the underlying reasons, opinions and motivations. Quantitative data were entered into an Excel spreadsheet for statistical analysis. The results are presented in bar charts, line charts and tables to simplify the data and its summation. Variables are presented as percentages for categorical data.

6 THE CASE STUDIES

6.1 Project 1: Water Conservation Garden

The Water Conservation Garden project is located on the branch campus of OSU in Oklahoma City (OKC). It is a one-acre vacant site; however, its surrounding context is complex, including campus office / classroom buildings, greenhouses, a farmers' market, parking lots, gardens, a storm water retention pond, numerous roads and a five-hole public golf course. The project is a collaboration among OSU teaching and Extension faculty, OSU-OKC faculty and the OSU-OKC groundskeeper. The project's program is focused on sustainable storm water management and low impact development. Faculty chose the Landscape Architectural Construction II: Sustainable Sites Design class for this service-learning assignment.

6.2 Project 2: Concordia Memorial Design

Concordia is a retirement community owned by a non-profit organization in OKC, and administrators hope to use their courtyard space as a memorial site. Concordia's request for design assistance matched the OSU Extension's mission, and subsequently Concordia began the process of working with OSU on the memorial project. The site conditions, aspect, size, location and proximity to the community's residential buildings made the site suitable for a memorial design project. The central element of this project was a memorial feature that commemorates the loved ones of the residents in the community. Because Concordia is a retirement community, the design of all site elements needed to be senior-friendly, and accessible for those with disabilities. It needed to function as a therapeutic garden which could give visitors physical and psychological benefits. After careful consideration, the faculty assigned the project to the Site Design Studio class.

6.3 Project 3: The Teaching Gardens at Will Rogers Park

This is a project located in a well-known public park, Will Rogers Park, in Claremore, OK. The Master Gardeners Association of Rogers County (MGARC) previously reached an agreement to build a portion of the Park as a teaching garden for the public and decided to work with OSU to design it. The project site has varying topography, numerous shade trees, a parking area, a tool shed, a shade structure, a recently-built splash pad and a historical feature that requires protection. MGARC's vision was a teaching garden that would teach a wide range of sustainability topics to the public, incorporating sustainability, plants, storm water management, hardscape materials and renewable energy applications. Faculty assigned the project to the Construction II: Sustainable Sites class.

6.4 Projects in action

Before the three real-world projects were announced, students requested an alternative to the typical "made-up" design studio project (i.e., a project without a plan for construction). A "made-up" project may appear to students to be fabricated, but OSU faculty carefully planned every speculative project, embedding it with intentional theoretical, conjectural, and academic learning outcomes. Once the faculty

announced the three real-world projects, the students were highly motivated to move on to the real-world problem, becoming more engaged in the design process from the start.

Real project-centered learning approach: The curriculum was structured like a professional design office. Students carried out typical design project steps that included a site visit, site inventory, client interview, on-site observations and documentation, program assessment, site sketches, site notes, photos and videos. A shared electronic folder to store photos, videos and design drawings was set up for the entire class to access. The studio class then went through the following steps of the design process: site analysis, preliminary concept design and interim review (with client and invited local professionals). In-studio collaboration, active participation, client input, student output and professional critique and feedback were the norm. The students' applied design process included conceptual diagrams, brainstorming, posting thumbnails, programming, preparing schematic design, receiving teacher's desk critique, and preparing written reports. The project then went into the final design phase, producing the design package, and final presentation. After each presentation, jury members asked questions, critiqued students' design and presentation style, and made comments and suggestions.

The experiential learning experience approach: Each project was planned for students to maximize their exposure to the client's expectations, on-site observations, design-build reality, project schedule management and professional-in-training strategies. These strategies guided student engagement activities throughout the five-week design process. Faculty planned a combination of field-based and classroom-based experiences to facilitate the students' exposure to the landscape architecture design process. For the field-based experiences, students conducted site visits, identified site opportunities and constraints, thought through a preliminary site analysis, interacted with clients on site, and determined the client's requirements. For the classroom-based experiences, the students prepared the physical site analysis, preliminary design, and final design while interacting with clients for interim review and final critique. The project timeline was organized to guide students to take control of their own design pace and deliver the product by the deadline. The teacher acted as the project source to both the clients and students throughout the design process (e.g., providing suggestions to clients and design direction to students). The teacher was a professional adviser who helped students build confidence. Students were treated as landscape architects-in-training in a professional setting throughout the experiential process. By completing the project, students applied the course lecture material to the project, and reflected on class theories and the project design process.

The client-professional interaction approach: Faculty planned three client-class design studio interactions throughout the project, one of the most unique aspects of a real-world project compared to a speculative project. The first interaction occurred when students and faculty met the client during a site visit at the beginning of the project. Clients guided the students through the site; and introduced the project background, surrounding context, site inventory information, culture, history, and the client's vision and concerns. The second interaction occurred during the interim review. The third client-class interaction occurred at the final presentation. During these three interactions, a unique situation was created for the students, client and faculty to communicate, discuss, and cooperate; students asked thorough questions, presented their design concepts, responded to the client's questions, and received the client's comments and feedback. In advance of the three client-class interactions, faculty conducted a site visit with the client to pre-evaluate site conditions. After the final presentation, faculty composed a final design report for the client.

The community service awareness approach: Faculty introduced each project to students with an emphasis on community service. For example, safety and usability were the key concerns for the Concordia Memorial Design project, and students complied with the design guidelines of the Americans with Disabilities Act. Through this process, students used design tools to fulfill their vision of not only a beautiful design but also a safe and functional place for the retirement community. For the teaching gardens at Will Rogers Park, students created varied spaces to facilitate interaction between the Master Gardeners group and the public, including children's learning areas, a Native American cultural space and loop routes for those with mobility issues. Students began to understand that the most important aspect of community service is an authentic awareness of the community's needs. These are valuable philanthropic values that landscape architecture students need to comprehend, which will help them go a long way in their future professional development.

6.5 Case studies outcomes

All four service-learning approaches were interwoven throughout the project. They formed an

organic web to guide and support students going through the design process; whereby students felt more engaged, motivated, responsible, respected as professionals-in-training; and experienced a deeper cognitive learning experience. In addition, the clients were very satisfied in the process. All the serviced communities have received design ideas that could be implemented and felt that their communities were supported by the university. The survey results from the students' preferences in the Results section proved that there was a positive influence of the service-learning with real-world projects in landscape architecture design education.

7 RESULTS

The Real Project Experience survey posed ten questions to determine how well students performed on a real project versus a speculative project in their design classes:

- Q1. The real-world service project interests me more.
- Q2. I am more engaged and committed in the design process of the real-world service project as I felt I had real responsibilities.
- Q3. I have learned how to treat real site constraints and solve real problems through the real-world service project.
- Q4. I gained more hand-on design skills from the real-world public project.
- Q5. I gained experience how to interact with clients from the real-world service project.
- Q6. I gained valuable experience on how to present my design in front of real clients.
- Q7. I was valued as a professional by the client, and I felt I made a contribution to the community.
- Q8. The service project satisfied my urge towards public service and helping communities.
- Q9. I learned more when I am working on a real-life project comparing to a "made up" project.
- Q10. The real-world service project has helped you to see how classroom knowledge can be applied in real-world practice.

Author structured questionnaires on a 7-point scale for the respondents to evaluate, where 7 signified "strongly agree" and 1 signified "strongly disagree" while 4 served as the neutral point. The 7-point scale is commonly called a Likert scale; when responding to the survey questionnaire, respondents specify their level of agreement or disagreement on a symmetric agree-disagree scale for a series of questions. The neutral point is set at 4, and each increased or decreased equal-interval, numerical point reflects the intensity of the respondents' feelings for a given question. The participants' perceptions to each point of scale was treated as ordinal data with equal intensity between adjacent levels (Likert, 1932, p. 15). (Table 1)

Table 1. The example of a 7-point scale question for the real project experience survey.

Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
7	6	5	4	3	2	1
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7.1 The bar charts

The survey data from the three projects were combined to plot the bar charts and the survey outcomes affirmed the interesting impacts of the author' approach. A low percentage of respondents who expressed the preference of "neutral" to questions 3, 4, 7, and 10 at 4%; to questions 8 and 9 at 19% and 15%. None of the participants expressed any "disagree" preferences. Nineteen percent of the students held positive attitudes towards public service and helping communities (Q8). Fifteen percent of the students did not believe that they could learn more by working on a real-world project than they could by working on a speculative project (Q9). Respondents' comments that the clients did not provide an accurate project budget and that the service-learning project stopped at the schematic design phase indicated one drawback of service-learning projects in this study and reinforced the above survey results. Questions 1, 2, 5, 6 and 10 received high marks: for each question, more than 60% of students indicated "strongly agree"; when "strongly agree", "agree" and "somewhat agree" were combined the total score was nearly 100%. This signified that students did favor the real-world service project, felt more engaged in its design process, and gained experience in client interaction and presenting design solutions. Students learned to apply classroom knowledge in real-world project practice (Q1, 2, 5, 6, 10). Both of the bar charts exhibited an interesting

phenomenon: there was a group of respondents who expressed the preferences of “strongly agree”, “agree” and “somewhat agree” in the survey (depicted in the distribution of the skewed-right bar). These results confirmed that using real projects in design class helped students on multiple levels of service-learning, including real project-centered learning, experiential learning experience, client-professional interaction and community service awareness. (Figure 2 and Figure 3)

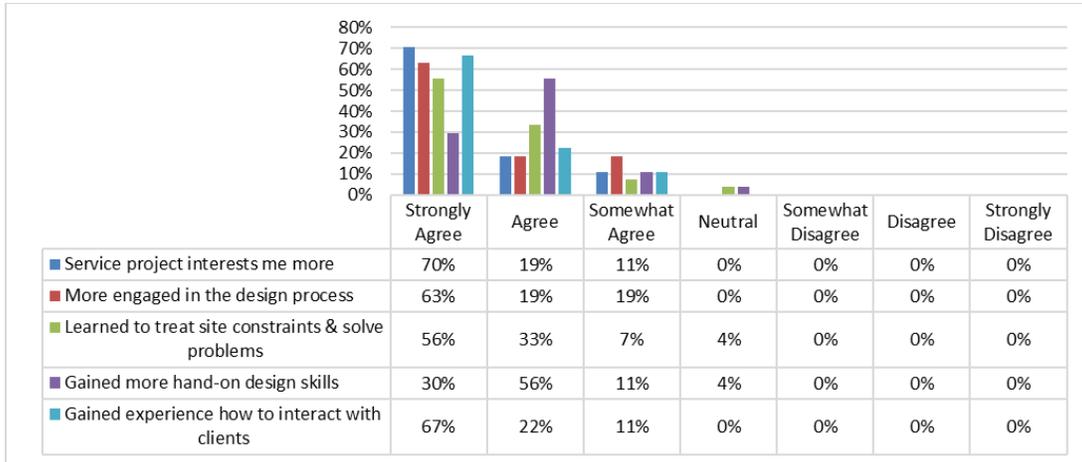


Figure 2. Service-learning projects Q1-5 survey results.

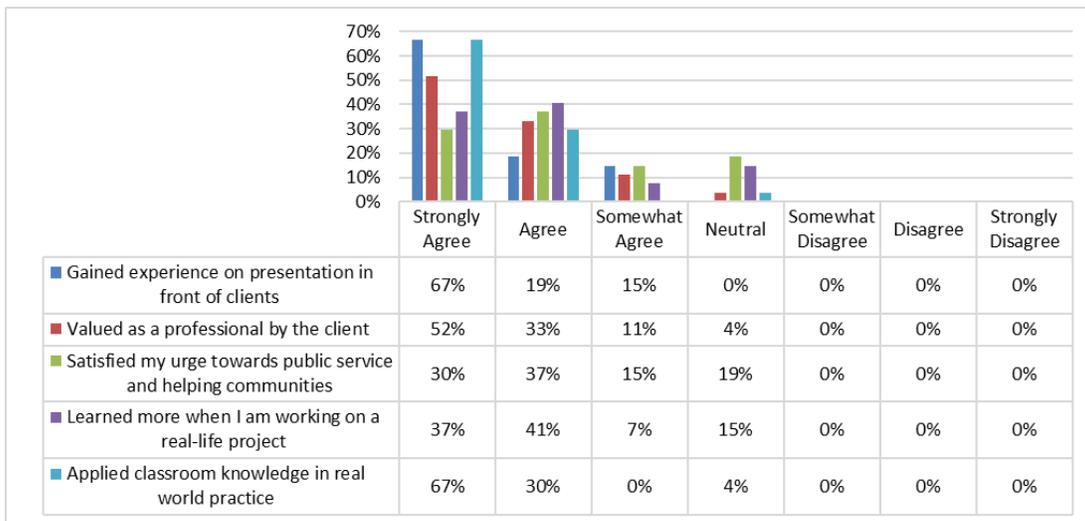


Figure 3. Service-learning projects Q6-10 survey results.

7.2 The Mean and the STDEV

The overall Means of respondents to the survey questions were on the agreement side of the scale. The Means of Questions 1 to 10 ranged from a low of 5.56 to a high of 6.42, both far away from the neutral point of 4.0. Other than Question 3 which has a mode of 6, the remainder of the questions had a mode of 7, signifying that most of the respondents were toward the “strongly agree” preference. Standard deviations of Questions 8 and 9 stood out at 1.13 and 1.11; this corresponded to their somewhat lower Means of 5.56 and 5.82. This result reconfirmed that some students (19%) held positive attitudes towards public service and helping communities (Q8), while some students (15%) did not believe that they could learn more by working on a real-world project than they could by working on a speculative project (Q9). With all the data considered, the service-learning projects were effective and worthy of inclusion in landscape architecture

design education. (Table 2)

Table 2. The end results of Means and STDEVs for all 10 questions in the survey.

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Mean	6.42	6.25	6.21	5.88	6.37	6.36	6.14	5.56	5.82	6.36
Mode	7	7	7	6	7	7	7	7	7	7
STDEV	0.75	0.74	0.87	0.76	0.71	0.73	0.85	1.13	1.11	0.72

7.3 The respondents' preference distribution

The overall preferences of the students to the survey questions were plotted in a distribution curve. The curve had a skewness of -1.25, which is a negative skew in which the left tail of the curve is longer than the right tail; the mass of the distribution was concentrated on the right side of the figure. This result indicated that a majority of respondents' preferences were on the positive agreement side while a few respondents with extreme disagreement preferences dragged out the left tail of the curve. One could compare the service-learning respondents' preference distribution curve with a normal distribution curve (hypothetically created) and see the effects. There were 40.35% of the respondents whose preferences resided within SD 0 to +1 and 40.5% whose preferences resided within SD 0 to -1. Results revealed a great concentration of positive responses towards the service-learning methods and approaches (Table 3 and Figure 4).

Table 3. The respondents' preference distribution for all questions.

Descriptive	Statistics	Zone	Area	%		
Mean	STDEV	SD+1	7.02	SD 0 to +1	2.0181	40.35%
	6.14	0.88	SD 0	6.14	SD -1 to 0	2.0258
Skewness	-1.25	SD-1	5.25	SD -2 to -1	0.8278	16.55%
		SD-2	4.37	SD -3 to -2	0.1299	2.60%
		SD-3	3.49			
		sum		5.0016	100.00%	

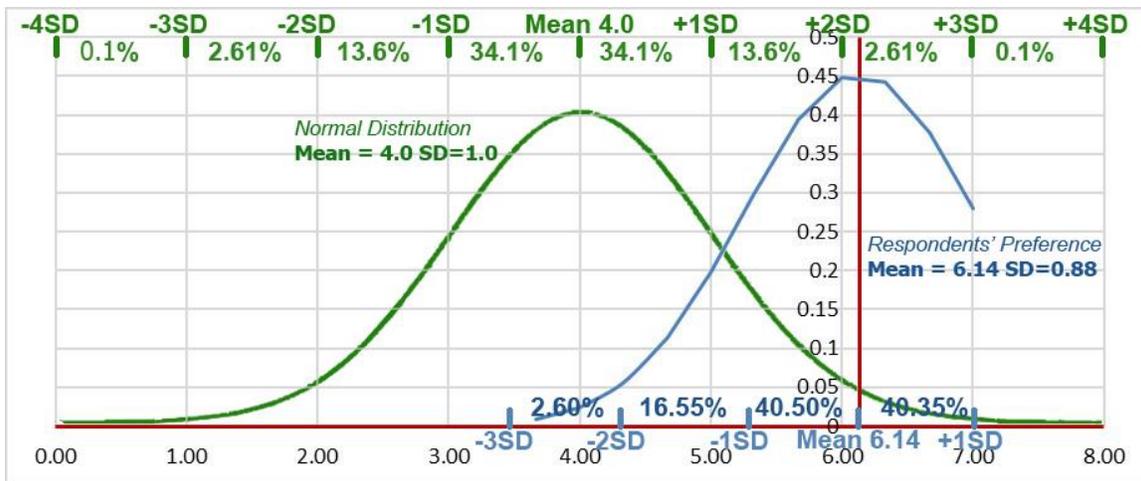


Figure 4. The respondents' preference distribution for all questions.

7.4 T-test results

This study further conducted a sequence of statistic tests (f-test and t-test). The Mean score for Project 1: Water Conservation Garden (P1) had no significant difference to the Mean scores for Project 2: Concordia Memorial Design (P2) and Project 3: The Teaching Gardens at Will Rogers Park (P3) using the two-sample t-test for equal variances, $p = 0.41 > 0.05$ (P1 & P2) and $p = 0.63 > 0.05$ (P1 & P3). The Mean scores for Project 2 (P2) had no significant difference to the Mean score for Project 3 (P3) using the two-sample t-test for equal variances, $p = 0.15 > 0.05$ (P2 & P3). Although the study engaged in three different

types of project for service-learning, the t-test results demonstrated that all three projects received high Means of 6.02 to 6.14 with no significant difference. Based on this result, this study determined that different types of service project did not affect the outcomes of the service-learning experiences (Table 5).

Table 5. t-test results for P1, 2, & 3 and the significant relationship of their Mean scores.

	P1 & P2	P2 & P3	P1 & P3
Mean	6.14	6.02	6.14
P(T<=t) two-tail	0.41	0.15	0.63
Significance	No	No	No

8 FINDINGS AND DISCUSSION

The overall Means of respondents to the survey questions were on the agreement side of the scale, around 6.0 (far away from the neutral point of 4.0). This signified that service-learning with real-world projects was a positive influence on landscape architecture design education. The real-world projects and service-learning approaches were effective tools for landscape architecture studio teaching and learning pedagogy. The t-test results signified that different types of service projects did not affect the outcomes of the service-learning experiences. However, the survey results indicated that some students held positive attitudes towards public service and helping communities, while some students did not believe that they could learn more by working on a real-world project than they could learn by working on a speculative project. Although a typical real-world project includes phasing of bid documents and construction (LATC, 2016, p. 4), students noted that a real-world service project without a realistic budget limited the service-learning project within the schematic design phase. This drawback of service-learning projects limited the benefits of a real-world exposure, and somehow limited the differences between a real-world based project and a totally speculative project. Therefore, a service-learning style project that coexists with a traditional teaching style project would balance the teacher's and students' interests and learning outcomes.

This service-learning with real-world projects applied various strategies and theories similar to those pointed out earlier in the literature search. They included a real project-centered learning approach aimed to create a real-world learning environment where students do a site analysis, site concept, report writing and schematic design solution for the applicable solution in a real-world (Loon, 2010, pp. 23-32; Govekar & Rishi, 2007, p. 3; Kinloch et al., 2015, p. 39). The experiential learning experience approach allowed students the opportunity to ascertain the client's expectations; and learn through on-site experiences, the design-build reality, office time line control and professional-in-training strategies (Gallagher and McGorry, 2015, p. 467; Knecht and Fischer, 2015, p. 378; Bettencourt, 2015, p. 473). The client-professional interaction approach allowed the interaction of communities, students and universities to provide professional service to the community via teachers' and students' contribution of knowledge (Gomez et al., 2015, p. 162; Harkavy and Hartley, 2010, pp. 418-9). And, students were able to learn to serve their communities through involvement in community projects, broadening their perspective of the professional ethic and civic responsibility (Seider et al., 2010, p. 485; Hatcher and Studer, 2015, p. 15).

Each service-learning project has unique physical, social and political characteristics, and the potential to influence students' learning experience varies by project. Cauley et al. (2001, p. 176) suggests that educators "develop a reflection component in which students have an opportunity to integrate the service and learning aspects of their experience"; this would strengthen the partnership established between faculty and clients, and influence students' learning experience. Although the survey results were overwhelmingly positive, during the design process students were focused on preparing the graphic presentation for their proposed designs versus writing. In hindsight, this study could have gone further by asking students to write a reflection paper to gain further insight into their learning experiences. One researcher points out that, in order to restore the public university's role in safeguarding American democracy, service-learning will need "transformative strategies of cumulative exposures, comprehensive experiences, capstone experiences, immersion experiences, interdisciplinary experiences and community participation and long-term community investment" (Sutton, 2012, pp. 70-71).

This study observed several positive trends: service-learning using real-world service projects enhanced students' interest in the course material, their engagement during the design process, their experience in interacting with clients and presenting design solutions, and their positive attitudes towards public service and helping communities. However, this study also had its limitations: a service-learning

project lacked the reality of billable hours, budget constraints and school schedule limits; and participants indicated that some clients couldn't provide timely feedback or a definitive budget for design. Moreover, service-learning practitioners in the design and planning fields have a tremendous amount of work ahead. In order to prepare students "to sustain the cultural and ecological integrity of the places they inhabit; smart growth as a means of achieving regional equity and environmental justice; and just sustainability as a means of living within limits, locally and globally" (Sutton, 2012, p. 72).

9 CONCLUSION

Through this study, real-world service-learning projects benefited students' experiential learning. Real-world projects that will be built motivated students and encouraged students' engagement in the landscape architecture design process. Students were able to think critically about their community's needs. With real clients, students practiced interacting with clients and better understanding clients' requirements. Students gained valuable experience in presenting proposed design solutions before clients. Finally, the collaborative design process strengthened the connection among the community, faculty and students.

While service-learning can provide many benefits in student learning, faculty need more administrative support to bring service learning into the classroom, such as rigorous recognition and "continuing education credit for faculty development" (Cauley et al., 2001, p. 180). Coordinating a service learning opportunity requires more hours of work than coordinating a speculative project. To coordinate a service learning project, faculty spend many hours initiating contact with clients, making a preliminary site visit, evaluating a project's appropriateness, signing a contract with the clients, finding a usable site base plan, taking students on a site visit, leading and guiding students' design, cheerleading students, coordinating all meetings, delivering a successful design package and preparing a post-design report. Service learning opportunities require instructors to act not only as landscape architecture faculty, but also as principals-in-charge and project managers, ensuring that every step in the design process flows smoothly to deliver a successful design product.

Once a faculty member has prepared a speculative project, it can be re-used many times in future courses. In contrast, a real-world project can only be used once in the current teaching year, because all the coordination efforts towards each project are unique, and each project has a different client. With so much additional effort invested in a real-world project, university administrators should prioritize real-world projects and provide more financial support to interested faculty. There are many educational and civic benefits arising from participation in real-world projects, and service learning should be encouraged to be part of the core design curriculum. Academic administration should commit to consistent term-to-term real-world projects. Faculty should develop a mechanism for assessing learning outcomes, such as feedback from students, faculty and community partners; and faculty should not only develop community partnerships to continue educational opportunities for students, but should also strengthen relationships with the community for future service learning (Voss et al., 2015, p. 400; Cauley et al., 2001, p. 180).

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